

AMENDMENTS TO THE CLAIMS - CLEAN VERSION

(Note: Except for the canceled original claims, numbering is as re-numbered in the Examiner's Amendment.)

Claims 1 - 105 (Canceled).

--1. (Currently Amended) A three-dimensional food product, elongated in at least the z-dimension and consisting of at least two components A and B which have been coextruded to become interspersed with each other, in which a plurality of cells of component A are surrounded at least in the xz plane by at least one component B which forms cell walls surrounding the A component, wherein said B component is a solid (including a viscoelastic solid) at 20° C, the cells of component A are arranged in at least two mutually distinct rows extending generally in the z direction, each said row of cells being separated from each adjacent row by a generally continuous in the z direction boundary cell wall of said B component, and either a) component A is a fluid having no compressional yield point at 20° C or is a solid having plastic, pseudoplastic or viscoelastic consistency at 20° C and a compressional yield point at 20° C which is less than 0.5 x the compressional yield point of B at 20° C, or b) component A is an expanded material containing at least 50% by volume gas.--

--2. (Previously presented) A product according to claim 1 having two generally opposite xz faces and in which each cell of component A extends in a generally y direction substantially from a position at least adjacent to one xz face of the food product to a position at least adjacent to the other xz face.

--3. (Currently Amended) A product according to claim 1 in which there are two different B components B_1 and B_2 and the boundary cell wall is formed of said first component B_1 and the product has bridging cells walls branching from said boundary cell walls and extending at least part way in a generally x direction towards the adjacent boundary cell wall, the bridging cell walls being formed at least in part of component B_2 .--

--4. (Previously presented) A product according to claim 1 in which the components B_1 and B_2 have different yield points at 20° C.--

--5. (Currently Amended) A product according to claim 4 (109) in which the yield point of component B_1 at 20° C is in the range of 0.1 to 0.5 of the yield point of B_2 at 20° C.--

--6. (Previously presented). A product according to claim 1 which has two generally opposite xz faces and each of the cells of component A extends part way between said two xz faces with at least two of said cells spanning the distance between the two xz faces, all of the cells being separated from one another in the y-direction, and B components are arranged between adjacent cells of component A and are separated from one another generally in the y direction to form cell walls around each component A cell, so that the A component cells are substantially enveloped by cell walls of component B.

--7. (Previously presented) A product according to claim 6 having two different B components B_1 and B_2 in which the B component between adjacent cells of the A component separated in the y-direction comprises component B_1 .

--8. (Previously presented) A product according to claim 1 in which there are bridging cell walls branching from said boundary cell walls separating adjacent rows of A component cells and extending at least part way in a generally x direction toward an adjacent boundary cell wall and between cells of A component in said rows, and said boundary cell walls and said bridging cell walls are formed of the same B component.

--9. (Previously presented) A product according to claim 1, characterized in that any attenuation in the thickness of said bridging cell walls in the vicinity of a boundary cell wall has a local thickness generally not any thinner than 1/15 of the thickest portion thereof.

--10. (Previously presented) A product according to claim 8 in which said boundary walls of B-component extend in waved or zig-zagging manner about a plane extending in the zy plane.

--11. (Previously presented) A product according to claim 1 which has bridging cell walls formed of a component B branching from said boundary cell walls and extending at least part way in a generally x direction toward an adjacent boundary cell wall and the bridging cell walls which branch off from the boundary cell walls, considered in a yz plane, branch off substantially perpendicularly to the boundary cell wall at the branching points thereof.

--12. (Previously presented) A product according to claim 2 which further comprises surface boundary walls of a component B extending substantially continuously generally at least adjacent to each xz face thereof.

--13. (Previously presented) A product according to claim 1 in which each boundary cell wall separating adjacent rows of cells of said component A is substantially planar.

--14. (Previously presented) A product according to claim 1 in which the cross section of said cells of component A in the xz plane has an average dimension in the z-direction in the range of 0.5 to 10 mm.

--15. (Previously presented) A product according to claim 1 in which the average cross-sectional area of said cells of component A in the xz plane is in the range of 0,5 - 100 mm².

--16. (Previously presented) A product according to claim 1 in which the average separation between adjacent rows of said cells of said component A is in the range 1 - 25 mm.

--17. (Previously presented) A product according to claim 16 in which the boundary cell walls of said component B separating adjacent rows of said cells of component A have a minimum thickness in the x direction in the range 5 - 50% of the average separation between adjacent rows.

--18. (Previously presented) A product according to claim 11 in which the bridging cell walls have a minimum thickness of 0.1 mm.

--19. (Previously presented) A product according to claim 1 wherein component A in the final form of the product at 20° C is fluid.

--20. (Currently amended) A product according to claim 1 wherein component A in the final form of the product at 20° C is a

plastic, pseudoplastic or viscoelastic material having a compressional yield point lower than 1000 g cm^{-2} .

--21. (Previously presented) A product according to claim 20 wherein component A comprises a blend of solid particles selected from the group consisting of short fibres, nut- grain- or shell-pieces, film-pieces or flakes, with a water based solution or gel.

--22. (Previously presented). A product according to claim 20 wherein component A comprises a blend of solid particles selected from the group consisting of short fibres, nut-, grain-, or shell-pieces, film-pieces or flakes with an oil.

--23. (Previously presented) A product according to claim 1 wherein component B is in the form of a gel.

--24. (Currently Amended) A product according to claim 1 in which component B including a component B reinforced with solid particles selected from the group consisting of short fibres, or grain-, shell- or film-pieces or flakes, has a yield point of at least 200 g cm^2 .--

--25. (Previously presented) A product according to claim 1 wherein component B is comprised of fat, oil or wax with flavoring additives .

--26. (Previously presented) A product according to claim 1, wherein component B comprises protein .

--27. (Previously presented) A product according to claim 1, wherein component B is a microporous agglomerate of particles containing water in the pores, said particles being selected from the group consisting of short fibres or grain-, shell- or film-pieces or flakes and are bonded together by micro-stands of a

polymer selected from the group consisting of coagulated gluten or a natural or synthetic rubber as produced by coagulation of a latex.

--28. (Previously presented) A product according claim 1 wherein component B comprises a gel of a polymer selected from the group consisting of carbohydrates or carbohydrate related compounds.

--29. (Previously presented) A product according to claim 1 wherein component B comprises a polymer and in the boundary cell walls of said polymer B extending in a generally z direction the molecules thereof are molecularly oriented generally in the z direction.

--30. (Previously presented) A product according to claim 1 wherein component A is a juice containing dissolved sugar and is in form of a flowable soft gel or thick liquid thickened with a thickening agent.

--31. (Previously presented) A product according to claim 1 wherein component A is a juice in the form of a soft gel or a thick liquid thickened with a thickening agent and contains hydrolysed proteins to in sufficient amount to impart taste and nutritional value.

--32. (Previously presented) A product according to claim 1 wherein component A contains a pulp of subdivided protein fibres or film.

--33. (Previously presented) A product according to claim 1 wherein component A is a cultured milk product.

--34. (Currently Canceled)

--35. (Previously presented) A product according to claim 1 wherein component A comprises a meat paste.

--36. (Previously presented) A product according to claim 1 wherein the A component contains gas dispersed therethrough.

--37. (Previously presented) A product according to claim 36 which is a bread or cake and component A comprises expanded and baked starch and B comprises protein.

--38. (Previously presented) A product according to claim 36 wherein component B comprises cheese.

--39. (Previously presented) A product according to claim 1 wherein component A has two different components, A1 and A2.

--40. (Previously presented) A product according to claim 39 in which component A1 comprises a waterbased solution or gel forming a matrix for solid particles, and A2 comprises fat or oil forming a matrix for solid particles.

--41. (Previously presented) A food product which is a three dimensional solid at 20° C and is elongated in at least the z-dimension and consists of at least two components A and B which have different visual appearances and have been coextruded to intersperse segments of A and segments of B, wherein each B component is a solid at 20° C and each A component is a solid at 20° C, the segments of component A are arranged in at least two mutually distinct rows extending generally in the z-direction, and the rows of segments of component A and interspersed segments of component B are visible at at least one surface of the product extending generally in a xz plane.

--42. (Previously presented) A product according to claim 41 in which the segments of component A and segments of component B are attenuated in their minimum thickness adjacent their ends as compared to their thickness at points intermediate their ends and in which the segments are dragged out during their coextrusion so as to form an acute angle of less than about 45° with the z-direction in the xz plane.

--43. (Currently amended) A product according to claim 41 in which component A and component B are selected from the group consisting of the following combinations:

- a. dark chocolate/ light chocolate
- b. chocolate/marzipan
- c. chocolate/caramel
- d. two differently coloured edible gums or fruit gels.

--44. (Currently Amended) A method of manufacturing by coextrusion of a plurality of extrudable edible components in an extrusion die a solid food product in which the components are extruded in a z-direction from the extrusion die and exit therefrom, and in which at least one extrudable component A' is formed into a flow through a channel and an extrudable component B' is formed in a flow through a channel, the flow of B' being in generally an x direction transverse to said z direction adjacent the flow of A', in which after exiting from said die, the flows of A' and B' are regularly divided generally in said x-direction by a dividing member to form at least two rows of flows of A' and B' separated in the x-direction, in each of which rows the flows of A' and B' are segmented in the z direction with a segment of flow of

B' being joined upstream and downstream to each segment of flow of A', whereby B' segments are interposed between adjacent A' segments in the z direction and in which adjacent rows are joined to one another along their yz faces, and wherein after the joining of the segmental flows B' is transformed to a normally solid material B having a compressional yield point which is at least twice that of B'.--

--45. (Previously presented) A method according to claim 44 in which after the segments of flows are joined, the material A' is expanded to at least twice its original volume, or material A' is treated to reduce its yield point, if material A' is solid, or its apparent viscosity, if material A' is liquid, by at least one-half.

--46. (Previously presented) A method according to claim 44, wherein the extrusion is carried out at an elevated temperature and material B' is treated by cooling.

--47. (Previously presented) A method according to claim 44 wherein material B' is treated for form a coagulate or gel.

--48. (Currently canceled).

--49. (Previously presented) A method according to claim 47 wherein material B' normally has a continuous, firm gel structure and prior to its coextrusion is converted into extrudable form by disruption to a finely divided condition, and after the end of the coextrusion, material B' is treated to reestablish its continuous firm structure.

--50. (Previously presented) A method according to claim 47 wherein material B' is treated by chemical reaction to form the coagulate or gel.

--51. (Previously presented) A method according to claim 50 wherein a gelling reagent or coagulant is incorporated into material B' prior to the extrusion process and the rate of gelation or coagulation is retarded to delay gelation or coagulation until after the completion of said joining of said flows.

--52. (Previously presented) A method according to claim 51 in which said reagent or coagulant is incorporated into solid particles suspended in material B'.

--53. (Previously presented) A method according to claim 51 in which material B' is adapted to undergo gel formation or coagulation by enzymatic action and the gel formation or coagulation is carried out by means of an enzyme.

--54. (Previously presented) A method according to claim 47 wherein material B' is adapted to undergo gel formation or coagulation by action of a reactant and said reactant is incorporated in the material A', thereby gradually migrating into material B' when materials A' and B' are brought together in the coextrusion die.

--55. (Previously presented) A method according to claim 44 in which both material A' and material B' are each formed into at least two flows separated from one another in the x direction and in which flows of material B' are partially interposed between adjacent flows of material A'.

--56. (Previously presented) A method of coextruding at least two extrudable materials A' and B' in an extrusion die which comprises the steps of supplying at least one material A' from a reservoir therefor and advancing the same by extrusion pressure as

a flow through one extrusion channel and out of an exit from the channel end, and supplying at least one material B' from a reservoir therefor and advancing the same by extrusion pressure as a narrow flow through a separate extrusion channel and out of an exit from the channel end; dividing each of the flows of materials A' and B' not prior to the respective channel exits into segments of the respective extrudates by a dividing member therefor, each said dividing member moving relative to the corresponding channel exit to traverse the entire channel exit; and controlling the flows of both materials A' and B' out of the extrusion channel exit to cause said flows to be intermittent in nature in synchronism with the movement of said dividing members.

--57. (Previously presented) The method of claim 56 wherein said flows of said materials A' and B' are controlled to cause the respective materials to flow from the corresponding channel exits when said dividing members are in said first and second positions but not when said dividing members are moving across said channel exits.

--58. (Previously presented) The method of claim 56 in which said flows of said materials A' and B' are controlled to take place intermittently by periodically applying and releasing said extrusion pressure to the respective materials in the corresponding channels.--

--59. (Previously presented) The method of claim 56 in which said flows of said materials A' and B' are controlled to take place intermittently by periodically blocking and opening the channel exits to prevent said materials from exiting therefrom.

--60. (Previously presented) A method according to claim 56 including the additional step of joining together the segments of said materials A' and B' after their formation by said dividing member so that segments of material A' alternate with segments of material B'.

--61. (Previously presented) A method according to claim 57 in which the relative movement of said dividing members with respect to said channel exits creates a plurality of adjacent rows of segments of material A' and segments of material B' joined to the segments of material A' in said rows.

--62. (Previously presented) A method according to claim 44 which comprises the further step of collecting the rows of segments of materials A' and B' after they are joined, in a collection chamber in the form of a sheet.

--63. (Previously presented) A method of manufacturing by coextrusion in sheet, ribbon or filament form of a food product which is normally solid at 20° C and is comprised of at least two components A and B in segment form, wherein segments of component B are in contact with segments of component A, which comprises extruding flows of an extrudable component A pre-cursor A' and of an extrudable component B pre-cursor B' from separate orifices of an extrusion die, sub-dividing each of said flows into segments and combining said sub-divided flows in rows with the segments of pre-cursor B' generally alternating with segments of pre-cursor A' and, after extrusion, converting said pre-cursor B' to a solid material B, in which extrudable pre-cursor B' is adapted to be rendered normally solid by coagulation or gel formation and a coagulant or

gelling reagent is incorporated in pre-cursor A' whereby when said segments of pre-cursor B' are in contact with segments of pre-cursor A', said pre-cursor B' is gelled or coagulated by said reagent.

--64. (Previously presented) A method according to claim 63 in which said pre-cursor B' is adapted to undergo gelling or coagulation by the action of an enzyme and an enzyme is incorporated in said pre-cursor A'.

--65. (Previously presented) A method according to claim 64 in which pre-cursor B' comprises a protein and said enzyme is a protease.

--66. (Previously presented) An apparatus suitable for carrying out a process according to claim 44, comprising an extrusion die having channels for flow therethrough of at least two different relatively soft extrudable materials, said channels ending in orifices for exit in generally one direction of said materials from the channels, said channels being separated from one another in a direction generally transverse to said one direction, dividing members capable of moving in said generally transverse direction across the orifices to divide the flows into segments arranged in at least two adjacent rows extending generally in said one direction, and means for combining said rows of segments into a unitary product, and comprising further means for subjecting said product to conditions to convert at least one of the materials in the product from its relatively soft extrudable state to a relatively hard solid state.

--67. (Previously presented) Apparatus suitable for carrying out the process of claim 56, comprising an extrusion die having channels terminating in exit orifices through which at least two different extrudable materials may flow, said orifices being arranged generally in a row and separated from one another generally in the direction of said row, means for causing the materials to pass through the channels and out of said orifices, dividing members which are capable of intermittent movement relative to said orifices in generally said same direction across the orifices to divide the flows of materials therethrough, and means for controlling the movement of the dividing members and said means for causing the materials to pass through the channels and out of said orifices so that relative movement of the dividing members with respect to said orifices takes place intermittently and said materials are passed out of said orifices while relative movement between the dividing members and the orifices is stopped.

--68. (Previously presented) Apparatus as in claim 67 wherein said means for causing said material to pass through said channels and out of the orifices thereof comprises a pressure member for each channel operable intermittently to exert and release extrusion pressure upon the material in such channel.

--69. (Previously presented) Apparatus as in claim 67 wherein said channels have entrance openings for introduction of the respective materials therein and further comprising reservoirs for the respective materials in communication with said entrance openings to deliver the materials therefrom to said openings and non-return valves between said entrance openings and said

reservoirs to prevent return flow of materials to said reservoirs when said pressure members exert extrusion pressure upon the materials in said channels while allowing flow from the reservoirs to said openings when said extrusion pressure is released.

70. (Previously presented) Apparatus as in claim 67 wherein said means for controlling the driving of said materials through said channels and out of the orifices thereof comprises valve means associated with each channel orifice and operable to alternatively block and open said orifices for passage of said materials therethrough.

71. (New) A method according to claim 44 wherein component A' has a consistency that is undesirably soft for ready extrusion but is at a desirable level in the final product and component A' is adapted to undergo at least partial solidification upon cooling, which comprises the further steps of prior to the introduction of said material A' to the flow channel therefor, subjecting material A' to sufficient cooling to partially solidify at least a major portion thereof into the form of suspended particulate solids whereby the consistency of material A' is modified for ready extrusion; and at the end of the extrusion, applying to the extruded product sufficient heat to melt said suspended particulate solids therein to thereby restore the desirable consistency of component A' in the final product.

72. (New) A method according to claim 44 which comprises the further steps of prior to the introduction of component A' into the flow channel therefor, dispersing through said component A' a polymer that has the effect of enhancing the flow consistency of

said component A' during the extrusion and is susceptible to treatment to depolymerize the same; and at the end of the extrusion subjecting the extruded product to treatment to at least partially depolymerize said polymer to thereby remove from the final product the consistency-enhancing effect of said component A'.